Module specification

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Module Code	COM456
Module Title	Games Technology
Level	4
Credit value	20
Faculty	FAST
HECoS Code	101020
Cost Code	GACP

Programmes in which module to be offered

Programme title	Is the module core or option for this programme
BSc (Hons) Computer Game Development	Core
BSc (Hons) Computer Game Development (with Industry Placement)	Core

Pre-requisites

None

Breakdown of module hours

Learning and teaching hours	36 hrs
Placement tutor support	0 hrs
Supervised learning e.g. practical classes, workshops	0 hrs
Project supervision (level 6 projects and dissertation modules only)	0 hrs
Total active learning and teaching hours	**36** hrs
Placement / work based learning	0 hrs
Guided independent study	164 hrs
Module duration (total hours)	200 hrs

For office use only	
Initial approval date	12/04/2019
With effect from date	01/09/2019

For office use only	
Date and details of revision	10/05/2023 AB approval of revalidated Games suite
Version number	2

Module aims

This module is designed to introduce technical and mathematical concepts that contribute to game design and development. The emphasis of this module will be to demonstrate these concepts against their relevance to game development and the wider industry to further creativity and problem-solving skills.

Students will engage in ongoing coursework pieces that utilise problem solving skills to relate concepts, theories and methods to real-world and virtual scenarios. These will revolve around industry standard tools, hardware and software.

Module Learning Outcomes - at the end of this module, students will be able to:

1	Identify technical fundamentals in relation to game design and development.
2	Utilise software packages to relate mathematical concepts to development tools and strategies.
3	Demonstrate technical solutions to game-based scenarios using industry standard technologies.

Assessment

Indicative Assessment Tasks:
Coursework will take place throughout the module using scenarios based upon current technologies in game development. Indicatively this may look like 6 standalone topic areas explore every two weeks of teaching. Students will be required to demonstrate their knowledge of applied mathematics and system hardware through questioning and demonstration surrounding these scenarios. These could be real-world or virtual scenarios but will represent applied theory according to the nature of games and software development.

The assessment scenarios will include levels of challenge where deeper understanding of task criteria will be required to achieve higher grades in the individual scenarios, demonstrating further achievement of learning outcomes. Each student will be required to attempt all scenarios to achieve a final coursework grade.

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)
1	1, 2, 3	Coursework	100%

Derogations

N/A

Learning and Teaching Strategies

In line with the Active Learning Framework, this module will be blended digitally with both a VLE and online community. Content will be available for students to access synchronously and asynchronously and may indicatively include first and third-party tutorials and videos, supporting files, sections of code/diagrams or any additional content that supports their learning.

As this module progresses, a structured strategy will be used to support the students engaging with the key threshold concepts relating to the learning outcomes. The module will include a balanced mixture of engaging tutor-led lectures, demonstrations, and facilitation. As the module continues experiential and peer learning strategies will be encouraged as the students' progress with their coursework.

Indicative Syllabus Outline

Yearly content will be updated to represent the most appropriate content for current industry technologies, but a list of indicative topics could include:

- Programming languages
- Algebra and Number Systems
- Statistics and Probability for Game Design
- Euclidean Geometry in 2D and 3D space.
- Software and Hardware Architecture
- Algorithms and Optimisation in Game Development
- Artificial Intelligence Systems
- Scripting for 3D Production Workflows
- Render Pipeline Technologies

Indicative Bibliography:

Essential Reads

Lengyel, E. (2016), *Foundations of Game Engine Development, Volume 1: Mathematics*, California: Terathon Software.

Other indicative reading

Dawson, M. (2014), *Beginning C++ Through Game Programming*, Fourth Edition, Boston: Cengage Learning.

Farrell, P. (2019), *Math Adventures with Python: An Illustrated Guide to Exploring Math with Code*, California: No Starch Press.

Roderiguez, A., Bruno, M. (2018), *Probability, Decision and Games*, Hoboken: Wiley.

Employability skills – the Glyndŵr Graduate

Each module and programme is designed to cover core Glyndŵr Graduate Attributes with the aim that each Graduate will leave Glyndŵr having achieved key employability skills as

part of their study. The following attributes will be covered within this module either through the content or as part of the assessment. The programme is designed to cover all attributes and each module may cover different areas.

Core Attributes
Engaged
Enterprising
Creative

Key Attitudes
Commitment
Curiosity
Resilience
Confidence
Adaptability

Practical Skillsets
Digital Fluency
Organisation
Leadership and Team working
Critical Thinking
Communication